EFFECT OF YOGA THERAPY ON PSYCHOLOGICAL VARIABLES AMONG CARE GIVERS OF SPECIAL CHILDREN: A RANDOMISED CONTROL TRIAL

A synopsis of the thesis
submitted for the award of
degree of

DOCTOR OF PHILOSOPHY

In

YOGA THERAPY

(FACULTY OF ALLIED HEALTH SCIENCES)

Submitted to

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May, 2025

TABLE OF CONTENTS

S.No	Topic	Page No.
1	Abstract	3
2	Introduction	4
3	Aims and Objectives	5
4	Research Question	5
5	Brief Review of Literature	6
6	Materials and Methods	9
7	Statistical Analysis	13
8	Results	13
9	Discussion	22
10	Limitations	23
11	Conclusion	24
12	Summary	24
13	Future Recommendations	25
14	References	25
15	Research Publication from the Study	27
16	Paper & Poster presentations	27
17	Conferences/CME/Workshops Attended	27

1. ABSTRACT

Background: Caregivers extend their care to others who need help to take care of themselves. They are formal (special educators) and informal caregivers (parents, relatives and friends). Caregiving responsibilities may encompass a range of supportive tasks. Caregivers play a profound role in the lives of children with special needs. It is often driven by compassion and commitment, it can lead to significant physical and emotional strain, manifesting as stress, anxiety, poor sleep, and burnout. Prolonged exposure to these stressors may adversely impact caregivers' overall quality of life, particularly when their own needs are unmet.

Methods: A randomized controlled trial study with a total of 136 caregivers (parents and teachers) affiliated with a special education school in Pondicherry. Participants were randomly allocated to either the experimental or control group. The experimental group was engaged in a one-hour yoga session twice weekly for 24 weeks. Data collection included demographic and four psychological scales administered at baseline, mid and post-intervention. Data were analysed using median, interquartile range (IQR), the Mann-Whitney test, and Wilcoxon test.

Results: Our findings revealed that the majority of caregivers reported elevated levels of caregiver burden, disrupted sleep, symptoms of depression, anxiety, and stress, along with reduced quality of life, consistent with existing literature. Post-intervention results demonstrated significant improvements in the well-being of the experimental group, including notable reductions in caregiver burden, sleep disturbances, and psychological distress, along with improved overall quality of life when compared to the control group.

Conclusion: It was concluded that yoga could help to reduce the caregiver burden and stress, enhancing the quality of life among caregivers.

Keywords: Caregivers, Yoga, Caregiver Burden, Quality Of Life, Depression, Anxiety, Special Children.

2. INTRODUCTION

Caregivers are persons extending care to others to enhance all round functioning and quality of life in the other person. In this context, formal caregivers are usually the special educators whereas informal caregivers may be the respective parents, relatives and friends. Caregiving responsibilities may encompass a range of supportive tasks. Supporting them demands extraordinary patience, resilience, and adaptability. Caregivers—whether parents, teachers, or guardians—play a profound role in the lives of children with special needs. Their daily responsibilities go far beyond routine care; they are the emotional anchor, advocate, and support system for a child who may require specialized attention in physical, mental, emotional, or behavioural domains.

Children with special needs often face life-long challenges, ranging from developmental delays and physical disabilities to emotional and sensory impairments. While the caregiving journey is rooted in love, it is also deeply exhausting. The physical strain and emotional toll can result in stress, anxiety, poor sleep, and even burnout. Prolonged exposure to such stress can negatively affects their overall quality of life.

In a comparison done between the caregivers and non-caregivers, they found only a slight difference in physical health status whereas the psychological health status showed a significant difference between the groups. The caregivers showed significantly more depressive symptoms than the non-caregivers.[1]

Yoga is derived from the Sanskrit word YUJ, meaning to yoke or join together. It signifies the union of the body and the mind. It has been expressed by many sages as the control over the mind and the stilling of the whirlpools of the mind (chitta vritti nirodha).[2] It is practised as an alternative therapy for patients with physical and mental disorders. The practice of Asana, Pranayama, Dhyana leads to the improvement of mental health and physical health.[2]

It has been seen in a few studies that Yoga is a very effective treatment for anxiety, stress and depression[3] and reduction in caregiver burden.[4] Regular practice of yoga as a therapy can act in a somatopsychic way to reduce the intensity of the disorder, increase immunity, strengthen the body and the mind, overall increase the feel good aspect of oneself and form a balance in the Pancha Koshas. Given the limited research on yoga as an intervention for caregivers of children with special needs, this study was conducted to address this lacuna by focusing on their unique challenges. The intervention aimed to facilitate acceptance, coping, and management of caregiving responsibilities through yogic practices. By enhancing awareness, the study encouraged more caregivers to adopt yoga for improved wellbeing. It specifically examined sleep quality, caregiving burden, stress levels, and quality of life. The findings contributed to evidence-based, holistic support strategies for this population.

3. AIMS AND OBJECTIVES

Aim: To study the effect of yoga therapy on psychological variables among caregivers of children with special needs.

Primary Objective: To evaluate the effect of yoga therapy on caregivers' burden.

Secondary Objectives:

- To measure the quality of life of caregivers of children with special needs.
- To evaluate the effect of yoga therapy on depression, anxiety, stress and quality of sleep in caregivers of children with special needs.

4. RESEARCH QUESTION

Can yoga therapy reduce caregiver burden and enhance quality of life among caregivers of children with special needs?

5. BRIEF REVIEW OF LITERATURE

International

The Zarit Burden Interview – Caregiver burden scale

Pandey and Sharma (2018) found that caregivers of children with Autism Spectrum Disorder (ASD) experienced **(47.5%) mild to moderate** and **(42.6%) moderate to severe** caregiving burden, 33**% anxiety** and **24.6% depression**. (Nepal)[5]

Ezzat et al. (2017) found that caregivers of children with autism experienced, **47.5% mild to moderate, 47.2% severe burden** and **42.6% moderate to severe** caregiving burden, significantly higher than the control group. (Egypt)[6]

Özdemir and Karadağ (2023) Results showed significant reductions in caregiver burden by the effectiveness of yoga as a complementary intervention for improvement in quality of life and mental health well-being compared to the control group. (Turkey)[7]

The Depression Anxiety Stress Scale – DASS-21

- Reilly et al. (2018) found that among the parents of children with special needs, mothers were significantly higher in the at-risk range than fathers on depression (55% vs. 33%), anxiety (47% vs. 26%), and stress (55% vs. 31%) subscales. (USA)[8]
- Kuper et al. (2019) the study found that caregivers experienced **depression (18%), anxiety (27%) and stress (36%).** (London)[9]
- Rojas-Torres et al. (2021) showed that mindfulness-based stress reduction (MBSR) and SC training significantly reduced stress and anxiety levels. (Spain)[10]
- Ketcheson et al. (2020) Results showed that the mindfulness yoga intervention group reported a **25% reduction** in PSS scores and a **49% improvement** in DASS scores compared to the control group. (USA)[3]

The Pittsburgh Sleep Quality Index- PSQI

- Ortiz-Rubio et al. (2021) results showed that 76.72% were poor sleepers and that as parents' level of burden increased by 1 point on the Caregiver Burden Index, the likelihood of being a poor sleeper increased by 4.7%. (Spain)[11]
- Gallagher et al. (2010) the results indicated that parents of children with developmental disabilities had 78% poor sleep quality. Caregiver stress emerged as the strongest predictor of poor sleep, even after adjusting for confounding factors. (UK)[12]
- Ergenekon et al. (2023) Results showed that caregivers had **35.7% mild depression, 12.5% severe depression, and 76.8% poor sleep quality**. (Turkey)[13]
- Lopez et al. (2018) results showed **significant reductions in anxiety, fatigue, depression**, and **improvements in well-being** and **sleep quality** for both groups, with the low-intensity class showing greater improvement in sleep with yoga intervention. (USA)[14]
- Milbury et al. (2015) The study demonstrates the potential of yoga-based interventions to **enhance psychological well-being** and **reduce sleep disturbances** in cancer caregivers. (International – USA)[15]

The World Health Organisation Quality of Life- BREF Scale - WHOQOL-BREF

- Pegorin et al. (2021) found that lower scores in quality of life, particularly in the physical and psychological domains, among caregivers of children with special health needs. (Brazil)
- Danucalov et al. (2015) found that yoga and compassion meditation program led to significant improvements in quality of life, attention, vitality, and self-compassion, among the participants compared to the control group. (Brazil)

NATIONAL

The Zarit Burden Interview – Caregiver burden scale

- Hegde et al. (2020) Results showed significant **reductions in caregiver burden scores at** mid-38%, and post 64% of dance and **mid 28% and post scores 61% of yoga group** compared to pre test in depression, anxiety, and stress, with improvements in quality of life for both Indian aesthetic dance (IAD) and yoga intervention groups. (Bangalore)[4]
- Varambally et al. (2013) highlights yoga as an effective intervention for reducing stress and enhancing the well-being of caregivers. (Bangalore)[16]

The World Health Organisation quality of Life- BREF Scale - WHOQOL-BREF

- Patel et al. (2022) found a high degree of caregiver burden, particularly in the **Burden Assessment Score**- physical and mental health domains with a **mean (SD) score of 14.72 (2.37**), among caregivers of children with autism spectrum disorder (ASD). The **quality of life** was lower for the physical and psychological domains with a **mean (SD) score of 39.9 (15.55) and 39.28 (14.31)** compared to the other domains (Lucknow)[17]
- Ganjiwale et al. (2016) found that caregivers of children with disabilities had the highest **quality of life** scores in **social relationships with a mean score (SD) 75.02(20.15)** and the lowest in the **environmental domain with a mean score (SD) 68.29(12.97)**. (Gujarat)[18]

6. MATERIALS & METHODS

Study Subjects

Caregivers of children with special needs who fulfilled the inclusion criteria.

Type Of Study

Open-label Randomized Controlled Trial

Place Of Study

Satya Special School, Puducherry

Duration of the study

July 2022 – September 2023

Selection Process

Study Population

Caregivers (parents and teachers) of children with special needs enrolled at Satya Special School. The study was conducted over a six-month period, with two weekly yoga sessions.

Inclusion

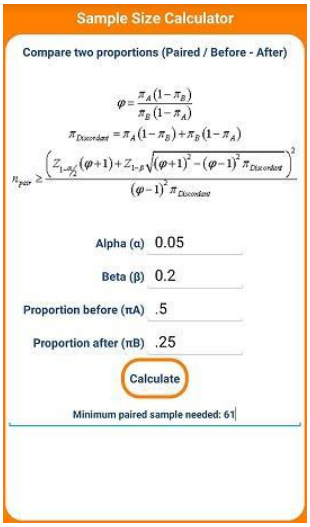
- Adult Caregivers categorised under the age of 50
- Caring for children with special needs under the age of 18
- Caregivers who were the primary caregiver or teacher
- Relatives who were primary caregivers for the child
- Caregivers of both genders
- Caregivers who willingly participated by signing informed consent form.

Exclusion

- Caregivers who had undergone surgery and were physically unable to participate in yoga sessions
- Caregivers who were pregnant or breastfeeding
- Caregivers who had had a history of alcoholism
- Severe stress scores in DASS 21 that was used as screening tool.
- Caregivers diagnosed with psychotic disorders
- Caregivers who were not able to participate regularly in the yoga sessions.

Sample Size

The sample size was determined using a sample size calculator for two groups, resulting in 61 participants per group. By accounting for a 10% dropout rate, the sample size increases to 68 participants per group, giving a total sample size of 136.



Z1- α/2 = 1.96 @ 95% of confidence with α = 0.05

Z1- β/2 = 0.842 @ 80% of power with β = 0.20

p1 = 50 % = 0.5 (Prevalence of stress among caregivers was assumed as 50%)

P2 = 25% = 0.25 (Reduced prevalence of stress after intervention was taken as 25 %)

n 1 = 61 considered 10% dropouts

n = 61 + 6.1 = 67.1

n = 68 in each group

Sampling Procedure

Stratified Random sampling

Study Groups

The study involved two distinct groups:

- **Group A**: Caregivers of children with special needs (n=68), referred to as the **Experimental Group**. Participants in this group received a structured yoga intervention aimed at evaluating its effects on their well-being.
- **Group B**: Caregivers of children with special needs (n=68), referred to as the **Control Group**. Participants in this group continued with their regular activities without any yoga intervention, serving as a comparison to assess the impact of the intervention.

Description of the Tools

- The Zarit Burden Interview ZBI
- The Depression Anxiety Stress Scale - DASS-21
- The Pittsburgh Sleep Quality Index - PSQI
- The World Health Organisation Quality of Life- BREF Scale - WHOQOL-BREF

The Zarit Burden Interview – ZBI The Zarit Burden Interview Scale has 22 items. The caregiver was requested to answer the items using a 5-point scale. The scale ranges from 0 - 4, where 0 is Never and 4 is Nearly Always.

Scoring of the Zarit Burden Interview Scale

0 - 20 = little or no burden,

21 to 40 = mild to moderate burden,

41 to 60 = moderate to severe burden,

61 to 88 = severe burden.

DASS 21

Dass - 21 is a scale designed to measure the emotional states of depression, anxiety and stress of a person. It has three self-reporting scales with a total of 21 items.

Scores for Dass - 21

Depression: Minimum Score=0 - 9(normal); Maximum Score=28+ (Extremely severe)

Anxiety: Minimum Score= 0 - 7 (normal); Maximum Score = 20+ (Extremely severe)

Stress: Minimum Score = 0 - 14 (normal); Maximum Score = 34+ (Extremely severe)

The Pittsburgh Sleep Quality Index (PSQI)

It consists of 19 individual items; it is an effective instrument used to measure the quality and patterns of sleep-in adults over the last month.

Scores for PSQI

Minimum Score = 0 (better); Maximum Score = 21 (worse)

TOTAL < 5 associated with good sleep quality

TOTAL > 5 associated with poor sleep quality

The World Health Organisation Quality of Life- BREF Scale - WHOQOL-BREF

The WHOQOL-BREF has 26 items. The four domains measured were physical health, psychological health, social relationships, and environment. It was scored on a range from 0 – 100 where higher scores indicated a better quality of life. Each item was rated on a **5-point Likert scale**, with responses indicating the frequency, intensity, capacity, or evaluation of different aspects of quality of life. The scale ranges from 1- 5. Where **1 is Very Poor / Not at all / Never** and **5 is Very Good / Extremely / Always.**

Methodology

Figure 1 presents the CONSORT diagram, summarizing participant enrolment and progression throughout the study. It outlines the numbers screened, excluded, randomized, and included in the final analysis. The diagram offers a clear depiction of the study's structure. It serves as a useful guide for understanding the trial's main findings.

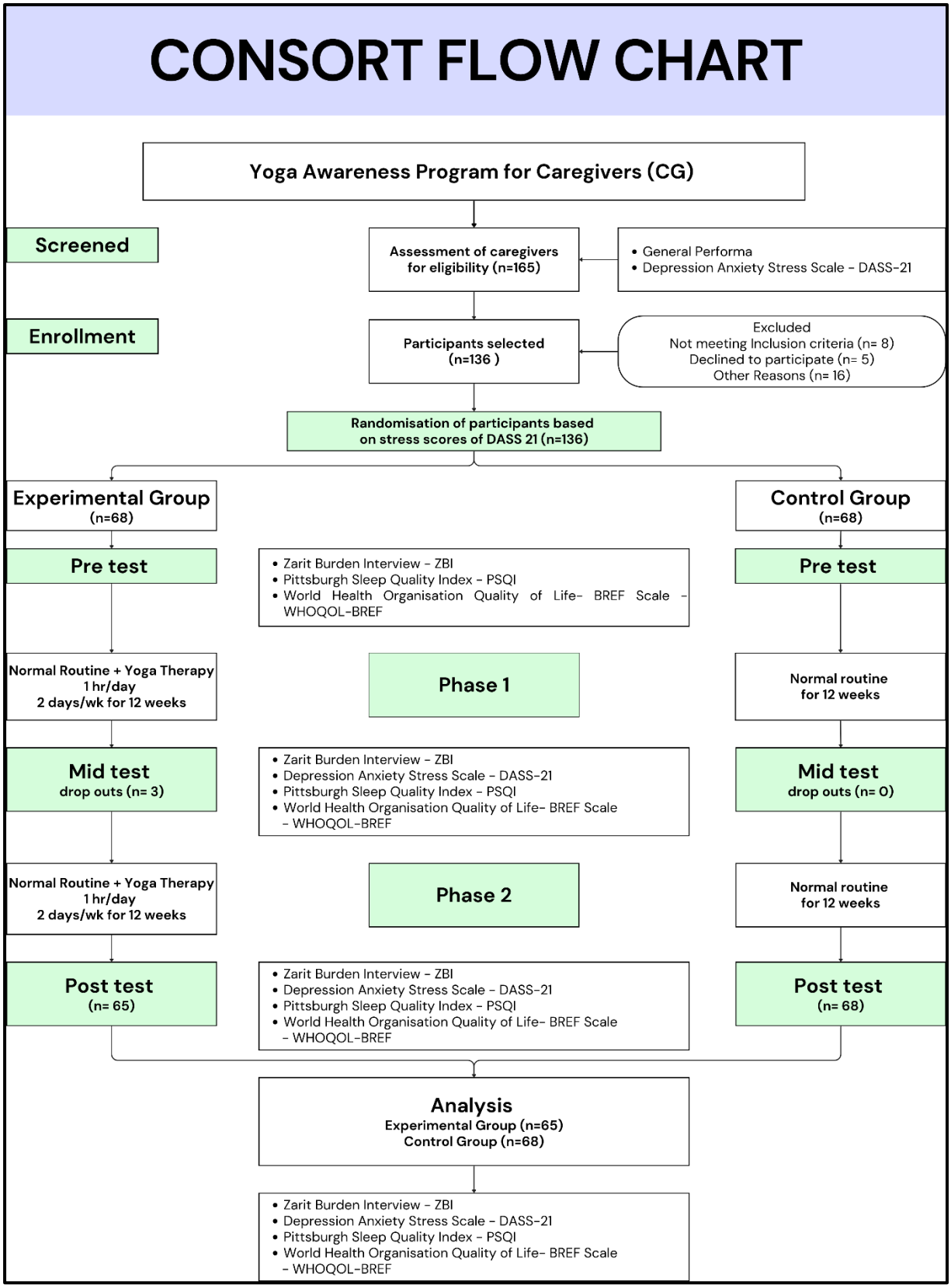

CONSORT FLOW CHART
Yoga Awareness Program for Caregivers (CG)
Screened
Assessment of caregivers for eligibility (n=165)
• General Performa
• Depression Anxiety Stress Scale - DASS-21
Enrollment
Participants selected (n=136)
Excluded
Not meeting Inclusion criteria (n= 8)
Declined to participate (n= 5)
Other Reasons (n= 16)
Randomisation of participants based on stress scores of DASS 21 (n=136)
Experimental Group (n=68)
Control Group (n=68)
Pre test
• Zarit Burden Interview - ZBI
• Pittsburgh Sleep Quality Index - PSQI
• World Health Organisation Quality of Life- BREF Scale - WHOQOL-BREF
Pre test
Normal Routine + Yoga Therapy 1 hr/day 2 days/wk for 12 weeks
Phase 1
Normal routine for 12 weeks
Mid test drop outs (n= 3)
• Zarit Burden Interview - ZBI
• Depression Anxiety Stress Scale - DASS-21
• Pittsburgh Sleep Quality Index - PSQI
• World Health Organisation Quality of Life- BREF Scale - WHOQOL-BREF
Mid test drop outs (n= 0)
Normal Routine + Yoga Therapy 1 hr/day 2 days/wk for 12 weeks
Phase 2
Normal routine for 12 weeks
Post test (n= 65)
• Zarit Burden Interview - ZBI
• Depression Anxiety Stress Scale - DASS-21
• Pittsburgh Sleep Quality Index - PSQI
• World Health Organisation Quality of Life- BREF Scale - WHOQOL-BREF
Post test (n= 68)
Analysis
Experimental Group (n=65)
Control Group (n=68)
• Zarit Burden Interview - ZBI
• Depression Anxiety Stress Scale - DASS-21
• Pittsburgh Sleep Quality Index - PSQI
• World Health Organisation Quality of Life- BREF Scale - WHOQOL-BREF

Figure 1: Consort Flow Chart for the Study

7. STATISTICAL ANALYSIS

- Normality testing was done using **Kolmogorov-Smirnov test**.
- Mean and **Median scores** were calculated, and data analysis was performed using **SPSS Statistics for Windows, Version 16**.
- **Intra-group comparisons** analyzed using Repeated Measures of Anova for normally distributed data with post-hoc analysis conducted via **Bonferroni test** and **Friedmann test** for non-normal data with Conovers Post hoc test.
- **Intergroup mean differences** in DASS, WHOQOL-BREF, ZBI AND PSQI were assessed using **independent t test**,.
- **Continuous variables** that were not normally distributed were evaluated using **Mann-Whitney U test and Kruskal-Wallis test**.
- **A p-value below 0.05** was regarded as statistically significant.

8. RESULTS

A total of 133 subjects participated in the study and their age (mean ± SD) with 95% confidence interval was 34.89 ±7.19 in experimental group and 36.61 ±7.34 in control group years (Table 1). The baseline characteristics of caregivers of children with special needs has been presented in Table 1 and 2. A greater number of caregivers in our study were females. Statistical significance was observed in the gender comparison (p=0.022). The remaining variables such as marital status, income, employment status, occupation, religion, and family structure did not elicit any statistical difference between experimental and control group.

Table 1: Baseline Characteristics and outcome of caregivers of children with special needs (N = 133)

Variable	**Personnel**	**Experiment**	**Control**	**Total**	Chi-square test	p-value
Gender	Female	55(84.66 %)	46(67.65 %)	101(75.94 %)	5.237	0.022
	Male	10(15.39 %)	22(32.35 %)	32(24.06 %)		
Marital status	Single	9(13.85 %)	8(11.76 %)	17 (12.78%)	5.333	0.149
	Married	45(69.23 %)	56(82.35 %)	101 (75.94%)		
	Separated	5(7.69 %)	1(1.47 %)	6 (4.51%)		
	Widowed	6(9.23 %)	3(4.41 %)	9 (6.77 %)		
Income per month	Up to Rs. 15,000	42(64.62 %)	39(57.35 %)	81(60.90 %)	6.491	0.165
	Rs.15,001 - Rs.25,000	9(13.85 %)	9(13.24 %)	18(13.53 %)		
	Rs.25,001 - Rs.50,000	1(1.54 %)	8(11.77 %)	9(6.77 %)		
	Rs. 50,001 - Rs.1,00,000	1(1.54 %)	0(0%)	1(0.75 %)		
	no comment	12(18.46 %)	12(17.647 %)	24(18.05 %)		
Employment status	Employed full time	40(61.54 %)	45(66.18 %)	85(63.91 %)	2.513	0.473
	Employed pat time	2(3.078%)	5(7.35 %)	7(5.26 %)		
	Unemployed	15(23.08 %)	10(14.71 %)	25(18.8 %)		
	No comment	8(12.31 %)	8(11.77 %)	16(12.030%)		
Occupation	Skilled	34(52.31 %)	38(55.88 %)	72(54.14 %)	0.337	0.845
	Unskilled	17(26.15 %)	18(26.47 %)	35(26.32 %)		
	No Comment	14(21.54 %)	12(17.65 %)	26(19.55 %)		
Religion	Christian	4(6.15 %)	6(8.82 %)	10(7.52 %)	0.875	0.832
	Hindu	57(87.69 %)	58(85.29 %)	115(85.29 %)		
	Muslim	2(3.08 %)	3(4.41 %)	5(3.76 %)		
	No comment	2(3.08 %)	1(1.47 %)	3(2.26 %)		
Family Structure	Nuclear family	43(66.15 %)	50(73.53 %)	93(69.93 %)	0.86	0.354
	Joint Family	22(33.85 %)	18(26.47 %)	40(30.08 %)		

Table 2: Baseline Characteristics and outcome of caregivers of children with special needs (N = 133)

Age	**Experiment**	**Control**	**Total**	Mann Whitney test	p-value
Mean (SD)	34.89 (7.19)	36.61 (7.34)	35.77(7.29)	1802.5	0.067
Median (IQR)	34.00(30,37)	37.00(31,41)	35.00(31,40)		

Notes: SD- standard deviation, IQR – Inter quartile range.

The parameters were analysed with Mann Whitney U Test to identify the statistical significance between the experimental and control group represented in Table 3. The pretest parameters are ZBI(p=0.768), DASS 21 depression(p=0.025), Dass 21 anxiety(p=0.313), Dass 21 stress(p=0.357), PSQI(p=0.518) AND WHOQOL-BREF physical domain(p=0.21), psychological domain(p=0.409), social domain(p=0.684) and environmental domain (p=0.737) were found to be insignificant, that is both groups are similar and comparable. At mid test and post-test assessment the above parameters showed extreme statistical significance between the groups (p= < .001).

Table 3: Comparison of the scores from The Zarit Burden Interview (ZBI), Depression Anxiety Stress Scale (DASS-21), and The Pittsburgh Sleep Quality Index (PSQI) and the World Health Organisation Quality of Life- BREF Scale (WHOQOL-BREF) for the experimental (n=65) and control (n=68) groups.

	Time Line	Groups	Mean± SD	Median (IQR)	MW Test	pvalue
ZBI	Pre-test	Experiment	35.75 ± 16.36	34 (26, 48)	2144	0.768
		Control	37.13 ± 16.75	34 (24.75, 49.25)		
	Mid-test	Experiment	27.85 ± 15.45	26 (17, 37)	1324	< .001
		Control	39.71 ± 16.35	37 (27.75, 52)		
	Post-test	Experiment	23.6 ± 14.04	21 (14, 34)	834.5	< .001
		Control	42.09 ± 15.62	39 (30, 54.25)		

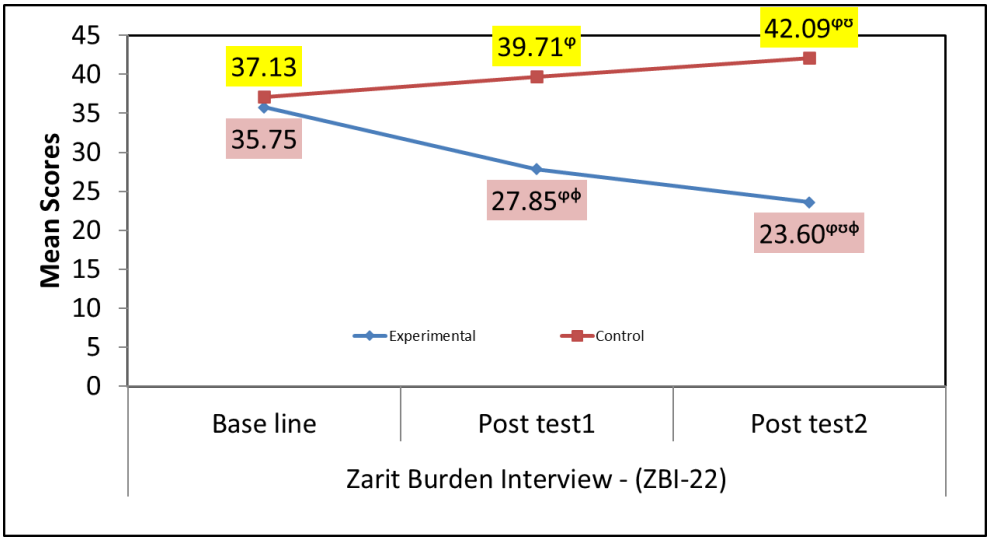
DASS 21	Depression	Pre-test	Control	15.2 ± 4.81	14 (12, 20)	2703.5	0.025
			Experiment	13.27 ± 4.25	14 (10, 16)		
		Mid-test	Control	13.05 ± 4.54	12 (10, 16)	1904	0.165
			Experiment	14.12 ± 4.13	14 (12, 18)		
		Post-test	Control	11.02 ± 4.24	10 (8, 14)	1085.5	< .001
			Experiment	15.29 ± 4.03	15 (13.5, 18)		
	Anxiety	Pre-test	Control	10.92 ± 3.68	12 (8, 14)	2427.5	0.313
			Experiment	10.18 ± 3.35	10 (8, 12)		
		Mid-test	Control	9.26 ± 3.15	10 (6, 12)	1504.5	0.001
			Experiment	11.18 ± 3.39	12 (8, 14)		
		Post-test	Control	7.88 ± 2.62	8 (6, 10)	667.5	< .001
			Experiment	12.24 ± 3.32	12 (10, 14)		
	Stress	Pre-test	Control	18.77 ± 3.67	18 (16, 22)	2412	0.357
			Experiment	18.03 ± 3.5	18 (16, 20)		
		Mid-test	Control	16.62 ± 3.41	16 (14, 20)	1361.5	< .001
			Experiment	19 ± 2.96	19 (18, 22)		
		Post-test	Control	14.25 ± 3.38	14 (12, 18)	565	< .001
			Experiment	19.85 ± 3.34	20 (18, 22)		
PSQI		Pre-test	Control	8.66 ± 2.69	9 (6, 10)	0.648	0.518
			Experiment	8.34 ± 3.05	8 (6, 10.25)		
		Mid-test	Control	6.74 ± 2.84	7 (4, 9)	1224	< .001
			Experiment	9.34 ± 2.95	9 (7, 11.25)		
		Post-test	Control	5.57 ± 2.7	5 (4, 7)	543	< .001
			Experiment	10.24 ± 2.83	10 (8, 12)		
WHOQOL-BREF	Physical Domain	Pre-test	Control	40.46 ± 8.44	38 (38, 44)	1937.5	0.21
			Experiment	42.49 ± 9.05	44 (38, 50)		
		Mid-test	Control	49.25 ± 9.42	50 (44, 56)	3397	< .001

			Experiment	39.93 ± 8.47	38 (31, 44)		
		Post-test	Control	57.08 ± 10.56	56 (50, 63)	4057	< .001
			Experiment	37.99 ± 7.62	38 (31, 44)		
	Psychological Domain	Pre-test	Control	42.15 ± 9.12	44 (38, 50)	2389	0.409
			Experiment	41.43 ± 8.67	44 (38, 44)		
		Mid-test	Control	51.17 ± 10.14	50 (44, 56)	3673.5	< .001
			Experiment	38.79 ± 8.3	38 (31, 44)		
		Post-test	Control	59.26 ± 12.11	63 (50, 69)	4100	< .001
			Experiment	37.56 ± 8.09	38 (31, 38)		
WHOQOL-BREF	Social Domain	Pre-test	Control	35.89 ± 11.69	31 (31, 44)	2298	0.684
			Experiment	35.74 ± 12.55	31 (25, 44)		
		Mid-test	Control	47.51 ± 11.28	44 (44, 56)	3507	< .001
			Experiment	33.82 ± 11.99	31 (25, 44)		
		Post-test	Control	56.15 ± 10.24	56 (50, 69)	4040.5	< .001
			Experiment	33.38 ± 11.87	31 (25, 44)		
	Environmental Domain	Pre-test	Control	43.23 ± 9.02	44 (38, 50)	2283.5	0.737
			Experiment	42.69 ± 9.58	44 (38, 50)		
		Mid-test	Control	47.99 ± 8.81	50 (44, 56)	3090	< .001
			Experiment	40.93 ± 9.95	41 (31, 50)		
		Post-test	Experiment	56.02 ± 9.54	56 (50, 63)	3820	< .001
			Control	40.74 ± 9.46	38 (31, 50)		

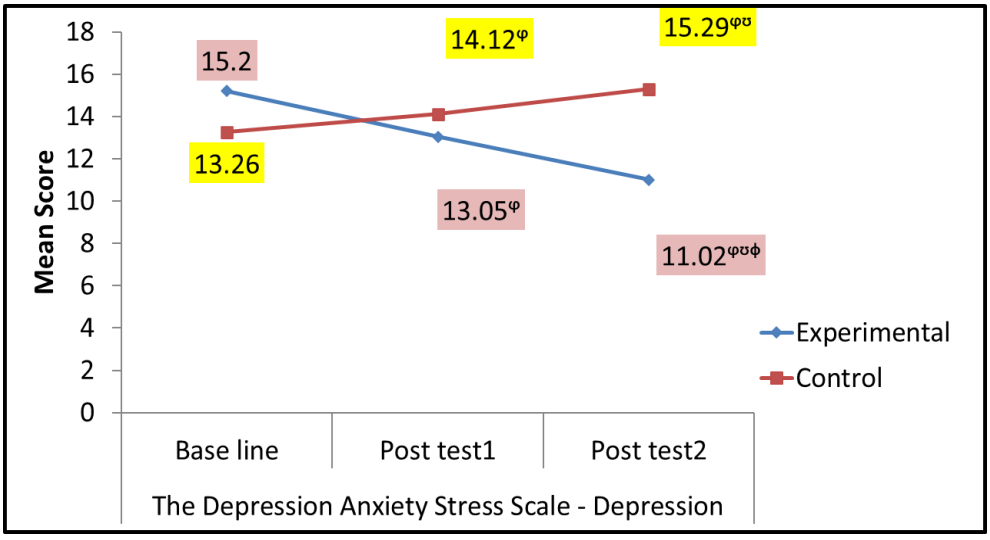
Notes: SD- standard deviation, ZBI-CBS -The Zarit Burden Interview - Caregiver burden scale, WHOQOL BREF- The World Health Organisation quality of Life- BREF Scale, DASS 21-The Depression Anxiety Stress Scale, PSQI-The Pittsburgh Sleep Quality Index

Notations for the significance between the values for the following graphs

φ	Base-Post1
φ	Base-post2
ʊ	Post1-post2
ϕ	Exp-con
φϕ	Base-post1, exp-con
φϕ	Base-post2, exp-con
φʊϕ	Base-post2, post1-post2, exp-con



The parameter ZBI was analysed using Mann Whitney U test between the experimental and control group. Statistical significance was observed at both mid-test and post-test between the two groups (p=<0.05). The same parameter was analysed using Friedmans test within the groups. Significant results indicated that experimental group showed a decrease in caregiver burden but an increase in control group.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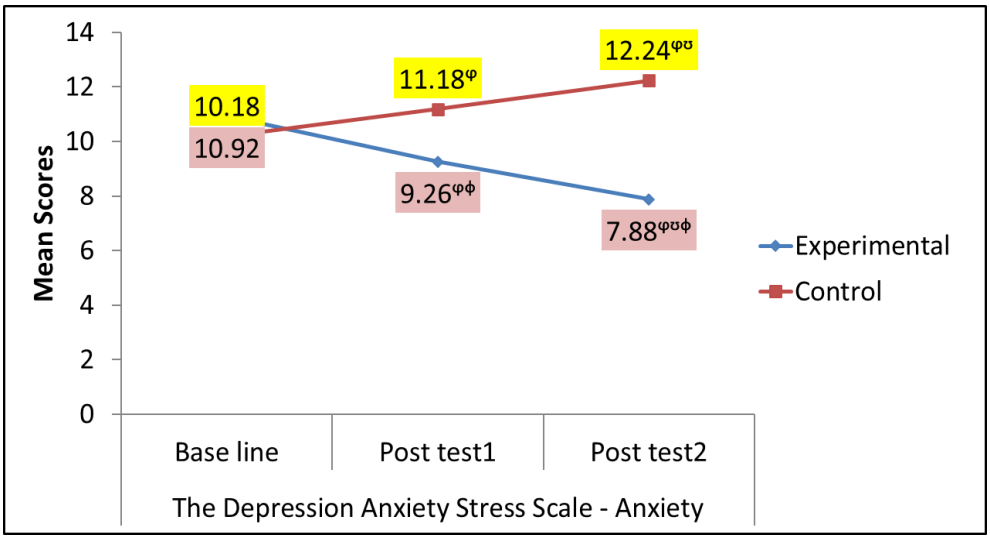
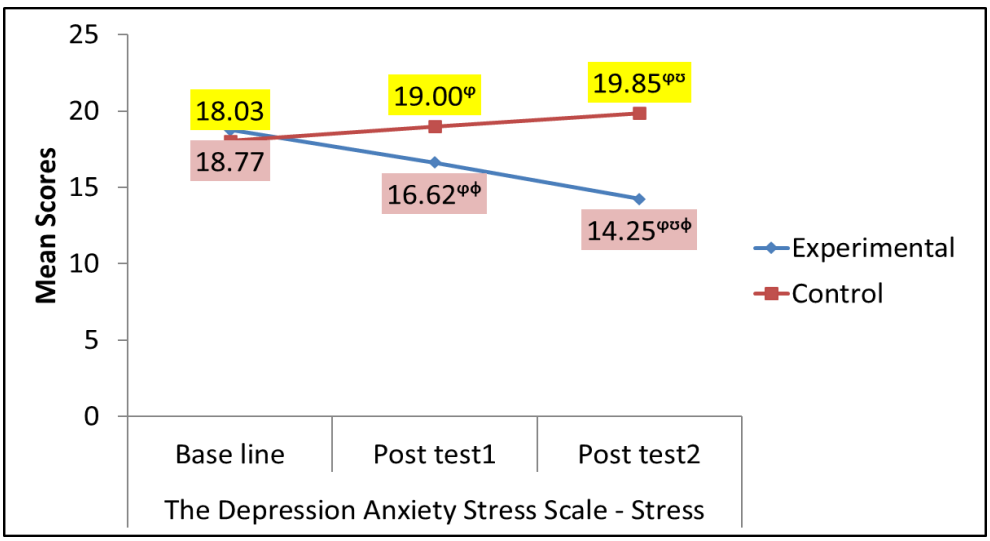
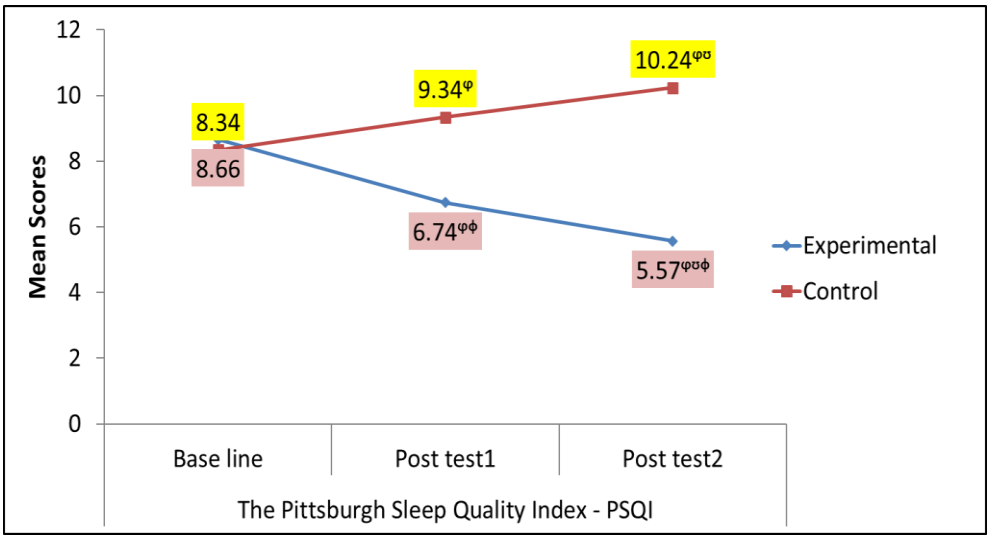
12
10
8
6
4
2
0
Mean Score
15.2
14.12φ
15.29φʊ
13.26
13.05φ
11.02φʊϕ
Experimental
Control
Base line
Post test1
Post test2
The Depression Anxiety Stress Scale - Depression

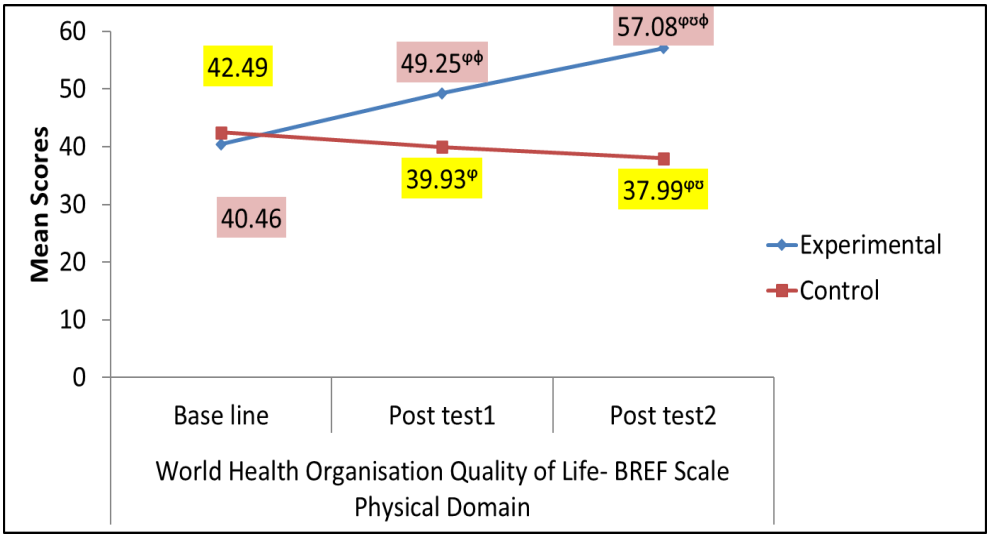

14
12
10
8
6
4
2
0
Mean Scores
10.18
11.18φ
12.24φʊ
10.92
9.26φϕ
7.88φʊϕ
Experimental
Control
Base line
Post test1
Post test2
The Depression Anxiety Stress Scale - Anxiety

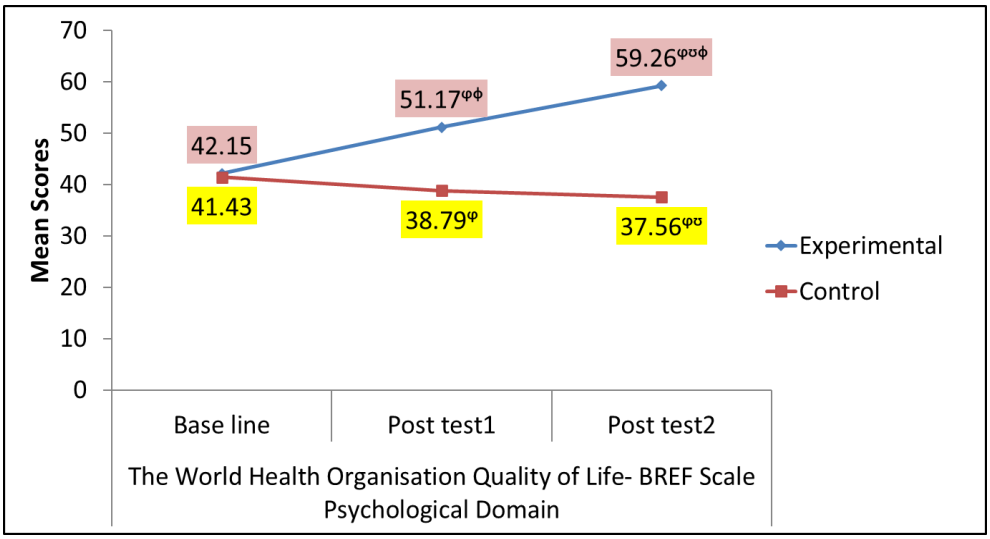

25
20
15
10
5
0
Mean Scores
18.03
19.00φ
19.85φʊ
18.77
16.62φϕ
14.25φʊϕ
Experimental
Control
Base line
Post test1
Post test2
The Depression Anxiety Stress Scale - Stress

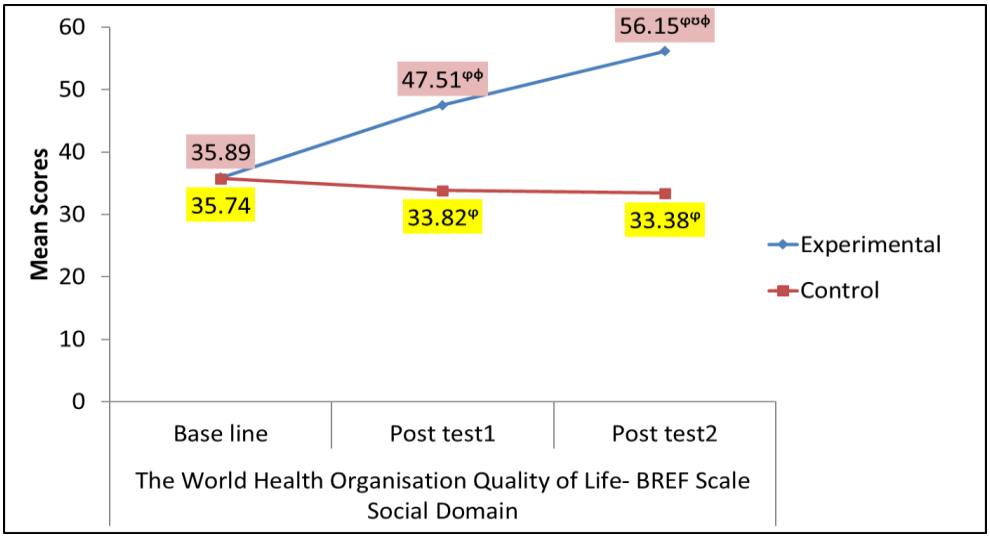
The study parameters depression, anxiety and stress were analysed using Mann Whitney U test for the experimental and control groups. Statistical significance was observed for anxiety and stress at both mid test and post-test. While all three parameters viz., depression, anxiety and stress showed significance only at post-test. Friedman test was performed to observe the significance of the parameters within the same group. The results showed a decrease in all three parameters within the experimental group. In contrast, the control group exhibited an increase for the above-mentioned parameters over the same period.

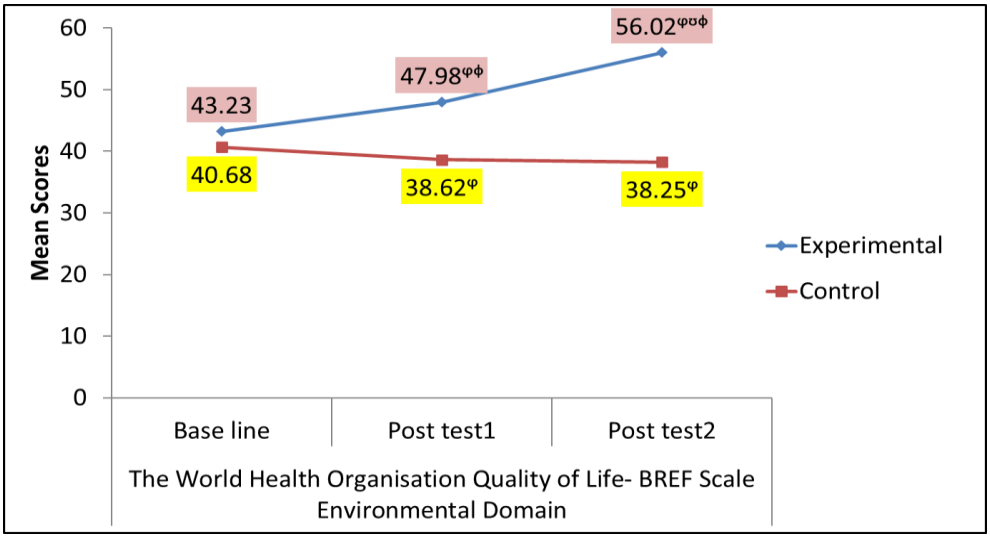


Mann Whitney U test was performed for the Pittsburgh Sleep Quality Index Scale to identify the significance level between the experimental and control groups. Statistical significance was observed at both mid test and post-test between the two groups. Friedman test was employed to observe significance at mid test and post-test within the groups. The results showed that there was an improvement and reduction in the quality of sleep within the experimental and control groups respectively.


60
50
40
30
20
10
0
Mean Scores
42.49
49.25φϕ
57.08φʊϕ
40.46
39.93φ
37.99φʊ
Experimental
Control
Base line
Post test1
Post test2
World Health Organisation Quality of Life- BREF Scale
Physical Domain


70
60
50
40
30
20
10
0
Mean Scores
42.15
51.17φϕ
59.26φʊϕ
41.43
38.79φ
37.56φʊ
Experimental
Control
Base line
Post test1
Post test2
The World Health Organisation Quality of Life- BREF Scale
Psychological Domain


60
50
40
30
20
10
0
Mean Scores
35.89
47.51φϕ
56.15φʊϕ
35.74
33.82φ
33.38φ
Experimental
Control
Base line
Post test1
Post test2
The World Health Organisation Quality of Life- BREF Scale
Social Domain



Mann Whitney U test was used to analyse the physical, psychological, social and environmental domains for the experimental and control groups. Statistical significance was observed for all the domains at mid test and post-test. Friedman test was performed to note the significance of the parameters within the same group. The results indicated that only the experimental group showed improvement, while the control group exhibited no change.

9. DISCUSSION

ZBI

In our study, the experimental group exhibited a significant reduction in caregiver burden following the yoga intervention, whereas the control group demonstrated an increase, indicating a deterioration in their burden levels. Similar findings were reported by Hegde et al., where caregiver burden showed a significant improvement post-intervention in comparison to the control group, suggesting that both yoga and dance interventions were effective in alleviating caregiver burden over time relative to no intervention.

DASS 21

According to our research, participants in the experimental group showed a significant reduction in depression, anxiety, and stress levels following the yoga intervention, aligning

with findings from Ketcheson et al. (2020), where participants in the MYTime group demonstrated a 49% improvement in DASS scores (from 20.8 ± 24.2 to 10.6 ± 13.3), while the control group showed no statistically significant changes.

PSQI

Our results indicated that the experimental group demonstrated significant improvements in sleep quality following the yoga intervention, whereas the control group exhibited a decline. These findings are consistent with those of Ortiz-Rubio et al. (2021) and Gallagher et al. (2010), whose studies conducted in Spain and Birmingham, respectively, reported that 76.7% and 72% of parents experienced poor sleep quality, highlighting the widespread prevalence of sleep disturbances among caregivers.

WHOQOL-BREF SCALE

Through our examination, consistent improvements were observed in the experimental group of caregivers across all domains, with marked enhancement in the psychological and social domains following the yoga intervention. In contrast, the control group experienced a decline in these areas. These findings are in line with those of Hegde et al. (2020), where a yoga-based intervention led to significant improvements in quality of life as measured by the WHOQOL-BREF, especially in the psychological and physical health domains.

10. LIMITATIONS

- The study was confined to a single school
- Yoga sessions were conducted only twice a week for six months
- The study lacked an extended follow up.
- Participants may not represent other caregiver populations.
- The effectiveness of yoga was not compared against other known interventions

11. CONCLUSION

- Caregivers of children with special needs have **compromised psychological and physical wellbeing**.
- **Yoga effectively reduced caregiver burden,**
- **Yoga improved quality of sleep and quality of life**
- **Yoga aids in reduction of depression, anxiety and stress**
- Efforts should be made to raise awareness about their health challenges and to **promote yoga as a practical intervention for alleviating mental health-related issues among caregivers**.

12. SUMMARY

- The research was conducted at a special school in Pondicherry, targeting both parents and teachers who serve as caregivers for children with special needs. A general proforma and DASS-21 scale were used for initial screening, and 136 eligible participants were randomly assigned to experimental and control groups based on their stress levels to ensure balanced distribution.
- The experimental group received yoga sessions twice a week for 24 weeks in addition to their regular activities, whereas the control group continued with their normal routine without any intervention.
- Data were gathered at three stages—baseline (pre-test), 12 weeks (mid-test), and 24 weeks (post-test)—using validated instruments: Zarit Burden Interview (caregiver burden), Pittsburgh Sleep Quality Index (sleep quality), and WHOQOL-BREF (quality of life).
- The results showed that the yoga intervention led to a significant reduction in caregiver burden, depression, anxiety, and stress, along with marked improvements in sleep quality and overall quality of life among caregivers in the experimental group.

- ❖ Our findings are consistent with previous research that has also demonstrated reductions in caregiver burden, depression, anxiety, and stress, along with significant improvements in sleep quality and overall quality of life.
- ❖ Yoga was found to be effective in reducing caregiver burden, alleviating depression, anxiety, and stress, while also enhancing sleep quality and overall quality of life.

13. FUTURE RECOMMENDATIONS

- ❖ Assess sustainability of benefits through follow-up studies.
- ❖ Use objective bio markers like cortisol levels, heart rate variability, or sleep tracking devices to support self-reported outcomes.
- ❖ Assess child's emotional and behavioral health (e.g., anxiety, depression) to explore caregiver–child interaction effects.
- ❖ Conduct multi-centric studies across different regions and communities
- ❖ Implement blinded assessments or use active control groups
- ❖ Embedding yoga programs within family, institutional or community-level caregiver support systems.

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15. RESEARCH PUBLICATIONS FROM THE STUDY

1. Philip Felix Priya, Ananda Balayogi Bhavanani, Meena Ramanathan, Karthik Subramanium, Sukanto Sarkar, A Lokeshmaran. (2024). "The Role of Yoga in Promoting Mental Resilience Among Special Educators in Puducherry". South Eastern European Journal of Public Health, 1909–1919.
2. Philip Felix Priya, Ananda Balayogi Bhavanani, Meena Ramanathan, Karthik Subramanium, Sukanto Sarkar, A Lokeshmaran. "Mental Health of Caregivers for Special Needs Children:Health Status of Caregivers of Special Needs Children of a Special School Puducherry". Rambam Maimonides Med J. (Accepted for publication)

16. PAPER & POSTER PRESENTATIONS

Paper:

"Benefits of Yoga practices for caregivers of special children" on International Yoga Day organised by Pondicherry Tourism Department, Pondicherry.

Poster:

"Importance of Yoga practices for families with children with special needs." - received 2nd place - National Seminar cum workshop on "Divyanga Yoga: Yogic Approach to Special Needs" organized by CYTER, at SBV Pondicherry on 14 June, 2019

17. CONFERENCES/CME/WORKSHOPS ATTENDED

- NFDP – "Skills in Scientific Writing" – 6th & 7th Dec.2019, organized by Dept. of Psychiatry, MGMC&RI.
- FDP – "Guidelines for Applying Extramural Research Grants" – 19th & 20th Nov.2019, organized by Deanery of Research, SBV

"The Role of Yoga in Promoting Mental Resilience Among Special Educators in Puducherry"

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KEYWORDS
caregivers, yoga, special educators, caregiver burden, quality of life, depression, anxiety, special children.

ABSTRACT:

Background:
Children with special needs often need extra support to navigate their daily routines and educational experiences. Special educators as caregivers play a crucial role in supporting these children at school, helping them with everyday tasks and tailoring instructional methods to meet their unique needs. The additional responsibilities and the expectation to deliver high-quality education contribute to increased stress and anxiety among these educators. Compared to general educators, special educators face a particularly challenging and demanding work environment, which can negatively impact their mental health and, in turn, their physical well-being.

Methods:
This study employed a randomized controlled trial design. A total of 68 special educators affiliated with a special education school in Pondicherry participated, with an average age of 33.71 years (±7.46). Participants were randomly allocated to either the experimental group or the control group. The experimental group was engaged in a one-hour yoga session twice weekly for 24 weeks. Data collection included four psychological scales administered both at baseline and post-intervention and a general demographic form administered at baseline. Data were analysed using median, interquartile range (IQR), the Mann-Whitney test, and the Wilcoxon test.

Results:
Our findings indicated that most special educators experienced high levels of caregiver burden, sleep disturbances, depression, anxiety, stress, and a diminished quality of life, aligning with previous research. Post-test results showed a marked improvement in well-being among the experimental group, with substantial reductions in caregiver burden, sleep issues, and mental health concerns, as well as enhanced life quality, compared to the control group.

Conclusion:
It was concluded that yoga could help to reduce the caregiver burden and stress, enhancing the quality of life among special educators.

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Priya Philip <priyaphilip12@gmail.com>

Fwd: MS#24-176R3 accepted after revision: Rambam Maimonides Med J

1 message

Yogacharya Dr.Ananda Balayogi Bhavanani <yognat@gmail.com>
To: Priya Philip <priyaphilip12@gmail.com>

Mon, May 19, 2025 at 2:17 PM

---------- Forwarded message ---------
From: **Rambam Maimonides Medical Journal** <EditorialOffice@rmmj.org.il>
Date: Mon, May 19, 2025 at 1:58 PM
Subject: MS#24-176R3 accepted after revision: Rambam Maimonides Med J
To: Ananda Bhavanani <yognat@gmail.com>
Cc: <i_ashkenazi@yahoo.com>, <d_hemstreet@rambam.health.gov.il>

Dear Professor Bhavanani,

We are pleased to advise that your manuscript number 24-176R3, entitled "Mental Health of Caregivers for Special Needs Children: Health Status of Caregivers of Special Needs Children of a Special School Puducherry", has been accepted for publication in *Rambam Maimonides Medical Journal*.

Thank you for your hard work in revising your manuscript with the assistance of Dr. Ashkenazi.

While your paper still needs some work to make it publishable, we are officially accepting your paper, with the aim of including it in the July issue of Rambam Maimonides Medical Journal.

We have assigned your paper to Mrs. Deborah Hemstreet, for follow-up with you (d_hemstreet@rambam.health.gov.il). She is currently reviewing your revised manuscript and will contact you soon regarding needed additional input – in particular regarding the Discussion. Please make it a priority to respond to her communications with you, to ensure timely publication of your paper.

We look forward to working together with you and seeing your research published in Rambam Maimonides Medical Journal.

With best warm regards,

Shraga Blazer, MD

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